Lat 39.37551 Lon -120.18106

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Reply To: 3420

Date: March 20, 1995

Subject: Mountain pine beetle activity in the Donner Camp area, Truckee Ranger District, Tahoe National Forest (NE95-6)

To: District Ranger, Truckee Ranger District

On March 10, 1995, Sheri Smith, Entomologist and Rick Maddalina, District Recreation and Lands Officer visited Donner Camp on the Truckee Ranger District. The objective of the field visit was to assess the current and past lodgepole pine mortality in and surrounding the Donner Camp site to determine what alternatives are available to prevent future losses. Access was still quite limited, however several trees were examined for mountain pine beetle activity.

Introduction

Donner Camp, listed on the National Register of Historic Places, is located approximately 2.5 miles north of Truckee on Hwy 89. It was the final camp site of the George and Jacob Donner families on their ill-fated attempt to cross the Sierra Nevada in 1846. The site also contains an enormous and extremely rich prehistoric lithic scatter.

Mountain pine beetle-related mortality has been occurring in lodgepole pine stands near Truckee for several years. Previous Forest Pest Management biological evaluations (see 3420. June 30, 1986 FPM Report No. 86-9) have provided management alternatives for several of these stands. Long term management with the objective of preventing unacceptable levels of mortality by improving tree and stand vigor through thinning has had encouraging results in the area immediately north of Prosser Lakeview Estates.

Field Observations

Donner Camp (35 acres) and two adjacent stands across Hwy 89 (<5, and 10 acres) consist primarily of lodgepole pine. There are some saplings however the majority of the trees are 80-100 year old. There is little or no new regeneration in the areas visited. All areas visited have current and past mountain pine beetle activity. Mortality has been observed throughout the area since the late 1980's with increasingly higher levels occurring over the past two years. Past management activities in Donner Camp have included the removal of hazard trees.

Typical mortality has occurred throughout the area in 3-10 tree groups of the co-dominant and dominant logdepole pine. Several of the trees examined in

Donner Camp had both bark beetle exit holes and larvae indicating successful attacks over consecutive years and/or the re-emergence of parent adult beetles. Numerous pitch tubes are quite evident over the entire bole of these trees, however the crowns have not faded yet. There are some large older dead trees in the camp that currently present a hazardous situation. A few of the trees examined had 1-3 pitch tubes which appeared to be unsuccessful attacks. In the area across Hwy. 89 there are several small groups of trees which are fading and several trees which have died over the past few years.

All three stands have the characteristics of being highly susceptible to mountain pine beetle attack: dominated by trees greater the 8" DBH, greater than 80 years old, a pure or nearly pure lodgepole type, overstocked and a history of infestation in surrounding areas. In addition to these characteristics, the recent protracted drought period with annual precipitation below normal six of the past eight seasons, has placed additional stress on the trees making them more favorable hosts for successful bark beetle attack.

DISCUSSION

The level of annual mortality will most likely not decline this year. The current generation of mountain pine beetles will emerge into the stands that remain highly susceptible creating additional mortality. Some moisture stress relief may be seen with the current above normal precipitation, however, mortality is likely to continue at a higher level in these stands until the stand conditions are altered either naturally by mountain pine beetle or through planned management activities.

The primary objective in management activities should be to minimize unacceptable levels of mountain pine beetle-related mortality by maintaining healthy and vigorous trees. In the Donner Camp area some component of older lodgepole (>80 years old) is desired to maintain the historical setting so emphasis should be placed on maintaining these trees in a healthy condition.

Management Alternatives

1. **Do nothing.** Mountain pine beetle will continue to remain active in these stands. Some relief may be seen in the number of trees attacked this year if the trees are immediately able to use the additional soil moisture. Once the beetle has reduced the stocking, predominantly in the larger DBH trees, the infestation will decline. The result of this alternative will be increasing numbers of dead trees, large unplanned openings and the continued risk of hazard trees.

2. **Direct Control.** There is no general agreement regarding the effectiveness of direct control of mountain pine beetle, however there may be limited application to the Donner Camp and immediate surrounding stands until long-term prevention management can be enacted. To implement this alternative a complete survey of every tree in the Donner Camp and adjacent stands would be necessary to determine which trees have been successfully attacked. These trees would require treatment, dependent upon the weather, by May 15, prior to beetle emergence. Yearly treatment and surveillance would be required dependent upon beetle activity. The stands will remain susceptible to mountain pine beetle until stand conditions are altered by long-term management. Several options

for direct control are available and further information can be provided if the District chooses to implement this alternative.

3. **Salvage.** Implementation of this alternative would result in the removal of all dead and dying trees in Donner Camp and adjacent stands. Value from fuelwood sales would be realized and the immediate threat of hazard trees would be lessened, however the underlying causes of stand/tree susceptibility would not be altered to prevent/reduce mortality. Mountain pine beetle would continue to cause mortality in the older, large diameter classes. Because of the "group kill" characteristic in these stands there may be openings larger than desired after salvage removal. Some type of revegetation in these areas may be desirable.

4. **Prevention.** The objective of management opportunities incorporating prevention would be to reduce the susceptibility of the trees to mountain pine beetle attacks. Preventative treatments can include thinning to promote stand growth and vigor and/or insecticide treatment to limit successful attacks.

A. Thinning. Thinning could be used to reduce the stocking in the clumps of lodgepole. Based on the initial field visit, the level of currently infested trees in Donner Camp is quite high so additional subsequent thinning opportunities may already be minimized. A complete evaluation of the area when accessible will be needed to determine the actual level of infestation. Based on additional surveys, silviculture prescriptions can be developed to meet the overall objectives. Basal area reduction and thinning from below may be appropriate within Donner Camp with a more aggressive approach at removing susceptible trees in the adjacent stands. Treatment of fresh conifer stumps with a registered borate compound to reduce the probability of annosus root disease infection is required for all conifer stumps in recreation areas (R-5 FSM 2303).

A vegetation management plan that would incorporate planned thinnings should be in place until the stands are replaced by regeneration. Thinnings should be implemented with the goal of creating mosaics of various ages and size classes that are less susceptible to mountain pine beetle attack and meet the overall objectives for maintaining the historical site.

B. Insecticide treatment. All noninfested lodgepole pines in Donner Camp greater than 8"DBH would be treated with a registered insecticide by spraying as much of the bole as possible. Treated trees would be protected from adult beetle attack. Trees would need to be treated prior to beetle emergence. This treatment would provide protection up to two years and give the District time to develop and implement long-term strategies to reduce overall stand susceptibility.

5. **Pheromone based strategies**

Identification of aggregation pheromones and field experiments using synthetic components have given insect management specialists a better understanding of the behavior of many bark beetles. Bark beetles engage in mass attacks that are mediated by complex pheromone systems. These chemical signals also provide potential tools for population monitoring and direct control in insect management programs. Pheromone based strategies can be used as part of an

integrated pest management program incorporating mass trapping, monitoring of beetle populations, and inhibition/disruption of beetle infestations. The pheromone based strategies that could be implemented in Donner Camp include mass trapping and tree baiting. These techniques could be implemented this year prior to beetle emergence but follow-up thinnings to reduce stand susceptibility would still be needed. The following uses of pheromones does not require E.P.A. registration.

A. Mass trapping. Mass trapping of bark beetles incorporates the use of funnel traps baited with aggregation pheromones to draw in nearby beetles thus reducing the number of beetles available to attack trees. This technique has been effective in isolated pockets of pine trees however it is often difficult to evaluate. Trap locations can be designated to limit bark beetle attacks in high use areas (ie. traps would be located across Hwy. 89 in the 2 adjacent lodgepole pine stands).

B. Tree baiting. This management strategy entails baiting uninfested, untreated or pesticide treated trap trees. The objective is to trap and kill flying beetles attracted to the trap trees. Tree baiting is highly effective in inducing beetles to attack selected trees. The trap trees must be baited with aggregation pheromones prior to beetle flight and also treated with a registered pesticide to kill beetles when they arrive on the trees. Trap trees would be located across Hwy 89 in the adjacent stands. There are pockets of trees that have already been attacked in these stands that could serve as trap trees, thus limiting additional mortality.

Conclusions

To reduce/limit unacceptable levels of mountain pine beetle-related mortality in Donner Camp and in the adjacent lodgepole pine stands consideration should be given to implementation of one or more of the above alternative this year. Forest Pest Management can assist in the further development and implementation of any of the described alternatives. In addition, Forest Pest Management prevention/suppression funds can be used for treatments. Suppression/prevention funding opportunities include funds that are available as FY94 carryover, funds from new FY95 projects (pending funding) and/or through a FY96 proposal. Please contact Sheri Smith (916-257-2151) if you have questions regarding this evaluation or need further assistance.

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